

## Effect of Extended Prophylactic Antibiotic Duration in the Treatment of Open Fracture Wounds Differs by Level of Contamination

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**Purpose:** The role of longer antibiotic courses in preventing surgical site infections (SSIs) has not been explored in large studies. In this secondary analysis of a large clinical trial, we aimed to determine the association between prophylactic antibiotic duration after the definitive wound closure of an open fracture and SSI.

**Methods:** For 2400 patients with open fractures of the extremities, we calculated the number of continuous days of antibiotic use after surgery for definitive wound closure. Using logistic regression, we estimated odds ratios (ORs) for the association between the duration of post-closure antibiotic use and SSI. Several covariates, including wound contamination severity, and interaction terms were included in adjusted models.

**Results:** 42% of participants received extended antibiotic prophylaxis, defined as 4 or more days of use after definitive wound closure. A significant interaction between antibiotic duration and wound contamination led us to report stratified adjusted ORs for each level of contamination. In open fractures with mild contamination, patients with extended antibiotic use had increased odds (OR = 1.41; 95% confidence interval [CI]: 1.05, 1.95) of SSI compared to those with shorter use. No association was found among patients with moderate contamination (OR = 1.08; 95% CI: 0.61, 1.90). In contrast, extended antibiotic prophylaxis was strongly protective (OR = 0.30; 95% CI: 0.12, 0.78) against SSI in patients with severely contaminated open fractures. Propensity score sensitivity analysis results were consistent with these findings.

**Conclusion:** This evidence suggests a differential effect of extended post-closure antibiotic duration on the likelihood of an SSI contingent upon the degree of contamination of open fracture wounds.